

### **REMARKS**

The Official Action mailed June 20, 2005, has been received and its contents carefully noted. Filed concurrently herewith is a *Request for One Month Extension of Time*, which extends the shortened statutory period for response to October 20, 2005. Accordingly, the Applicants respectfully submit that this response is being timely filed.

The Applicants note with appreciation the consideration of the Information Disclosure Statements filed on December 20, 1999, December 13, 2000, December 22, 2000, September 7, 2001, October 3, 2002, March 3, 2003, December 16, 2003, and November 1, 2004. However, the Applicants have not received acknowledgment of the Information Disclosure Statements filed on May 10, 2002, April 2, 2003, and October 2, 2003.

The Information Disclosure Statements filed on May 10, 2002, and October 2, 2003 (Mail Room Date October 3, 2003), including copies of foreign references cited therein, appear in the Image File Wrapper.

Regarding the Information Disclosure Statement filed April 2, 2003 (Mail Room Date April 7, 2003), although the Information Disclosure Statement itself and Form PTO 1449 appear in the Image File Wrapper, the Non Patent Literature cited therein, i.e. a copy of the *Request for Reexamination Pursuant to 35 U.S.C. §§302-307 and 37 C.F.R. §1.510* from Application No. 09/006,057 (11 pages) and a copy of the *Order Granting Request for Reexamination* mailed October 4, 2001 from Application No. 09/006,057 (9 pages), do not appear in the Image File Wrapper. As a courtesy to the Examiner, the Applicants resubmit herewith copies of the *Request* and a copy of the *Order*. It is respectfully submitted that the above-referenced Information Disclosure Statement was properly filed on April 2, 2003, and should be accorded its filing date for the purposes of consideration and compliance with 37 CFR §§ 1.97 and 1.98.

The Applicants respectfully request that the Examiner provide an initialed copy of the Form PTO-1449 evidencing consideration of the Information Disclosure Statements filed May 10, 2002, April 2, 2003, and October 2, 2003.

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A further Information Disclosure Statement is submitted herewith and consideration of this Information Disclosure Statement is respectfully requested.

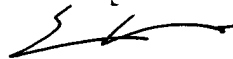
Claims 1-30 were pending in the present application prior to the above amendment. The specification and claims 1, 3 and 13 have been amended to correct minor informalities, and new claims 31-36 have been added to recite additional protection to which the Applicants are entitled. Accordingly, claims 1-36 are now pending in the present application, of which claims 1, 8, 13, 17, 25, 30 and 31 are independent. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

The Official Action rejects claims 1-30 under 35 U.S.C. § 112, second paragraph, asserting that claim 1 is "incomplete for omitting essential steps ... [t]he omitted steps are: depositing or forming steps." In response, claim 1 has been amended to recite a method comprising the steps of forming an insulating film comprising silicon oxide over a glass substrate, wherein the insulating film includes halogen at a concentration of  $5 \times 10^{20} \text{ cm}^{-3}$  or less and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less which are detected by secondary ion mass spectroscopy. It does not appear that the § 112, second paragraph rejection applies to dependent claims 2-7 or claims 8-30. The Applicants respectfully submit that amended claim 1 is definite. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 112 are in order and respectfully requested.

New claims 31-36 have been added to recite additional protection to which the Applicants are entitled. For the reasons stated above and already of record, the Applicants respectfully submit that new claims 31-36 are in condition for allowance.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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Eric J. Robinson  
Reg. No. 38,285

Robinson Intellectual Property Law Office, P.C.  
PMB 955  
21010 Southbank Street  
Potomac Falls, Virginia 20165  
(571) 434-6789



Docket No. 740756-2265  
Patent No. 6,025,630

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re PATENT of )  
Shunpei YAMAZAKI et al. )  
Patent No. 6,025,630 ) Group Art Unit: 2811  
Issued: February 15, 2000 ) Examiner: S. Loke  
For: INSULATING FILM FORMED )  
USING AN ORGANIC SILANE AND )  
METHOD OF PRODUCING )  
SEMICONDUCTOR DEVICE )

**REQUEST FOR REEXAMINATION PURSUANT TO**  
**35 U.S.C. §§302-307 AND 37 C.F.R. §1.510**

Commissioner for Patents  
Washington, D.C. 20231  
**ATTENTION: BOX REEXAM**

Attachment to Form PTO-SB/57  
requesting reexamination of  
U.S. Patent No. 6,025,630

Sir:

Reexamination of U.S. Patent 6,025,630 ('630 patent) that issued from U.S. Application Serial No. 09/190,828 ('828 application) filed on Nov. 12, 1998 is hereby requested pursuant to 35 U.S.C. §§302-307 and 37 C.F.R. §1.510. The '630 patent issued on February 15, 2000 and is still enforceable. This request is made on behalf of Semiconductor Energy Laboratory Co., Ltd. (hereinafter referred to as the "patentee"), the assignee of the '630 patent.

During a review of the prosecution history of the subject '630 patent, it was uncovered that the references submitted herewith were unintentionally omitted without deceptive intent during the filing of the '828 application which is based on U.S.

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Application Serial No. 08/198,054 filed on February 18, 1994 (now abandoned). These references may be deemed to present a substantial new question of patentability with respect to the '630 patent as set forth herein below. In this regard, claims for which reexamination is requested is identified below and a statement pointing out each substantial new question of patentability is also provided. In addition, also submitted herewith is an Information Disclosure Statement and PTO Form-1449 citing these references, copies of the references, a cut-up copy of the entire specification and drawings of the '630 patent for which reexamination is requested, and a copy of a Terminal Disclaimer of record. The requisite fee pursuant to 37 C.F.R. §1.20(c) is also enclosed.

CLAIMS FOR WHICH REEXAMINATION IS REQUESTED

Reexamination is requested of claims 1-16 (all claims) of the '630 patent in view of U.S. Patent No. 5,313,075 (Zhang et al.), U.S. Patent No. 4,772,927 (Saito et al.), and U.S. Patent No. 5,313,076 (Yamazaki et al.) which were considered in a related parent applications U.S. Ser. No. 08/455,574 (now abandoned) and U.S. Ser. No. 08/734,127 (issued as U.S. Patent No. 5,866,932) but were inadvertently not made of record during prosecution of the '630 patent. Furthermore, reexamination is requested of all claims of the '630 patent in view of the following references which were inadvertently not made of record during prosecution of the '630 patent:

U.S. Patent No. 5,288,518 (Homma) and related Japan Doc. No. 04-360533

U.S. Patent No. 5,821,138 (Yamazaki et al.)

U.S. Patent No. 5,837,614 (Yamazaki et al.)

Japan Doc. No. 01-238024

Japan Doc. No. 03-036767

Japan Doc. No. 03-268429

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Japan Doc. No. 03-289140

Japan Doc. No. 05-267480

Japan Doc. No. 06-053503

Japan Doc. No. 06-287755

Independent claims 1, 7, 11, and 14 of the '630 patent reads as follows:

1. An insulating film comprising silicon oxide formed over a glass substrate,  
wherein said insulating film includes halogen at a concentration of  $1 \times 10^{17}$   
to  $5 \times 10^{20} \text{ cm}^{-3}$  and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less which are detected by  
secondary ion mass spectroscopy.
  
7. A semiconductor device comprising:  
a crystalline semiconductor island formed over a glass substrate; and  
an insulating film including silicon oxide formed to cover the crystalline  
semiconductor island,  
wherein said insulating film includes halogen at a concentration of  $1 \times 10^{17}$   
to  $5 \times 10^{20} \text{ cm}^{-3}$  and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less.
  
11. A thin film transistor comprising:  
a crystalline semiconductor island formed over a glass substrate;  
a silicon oxide film formed to cover the crystalline semiconductor island;  
and  
a conductive film including at least one of aluminum, titanium, and  
titanium nitride, said conductive film being formed on the silicon oxide film,  
wherein the silicon oxide film includes halogen at a concentration of  $1 \times 10^{17}$   
to  $5 \times 10^{20} \text{ cm}^{-3}$  and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less.

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14. A thin film transistor comprising:  
a crystalline semiconductor island formed over a glass substrate;  
a gate insulating film including silicon oxide formed on the crystalline semiconductor island; and  
a gate electrode formed on the insulating film,  
wherein said gate insulating film includes halogen at a concentration of  $1 \times 10^{17}$  to  $5 \times 10^{20} \text{ cm}^{-3}$  and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less.

The remaining claims depend from one of the independent claims above.

STATEMENT POINTING OUT THE SUBSTANTIAL NEW QUESTION OF  
PATENTABILITY

In the Notice of Allowability mailed on August 25, 1999 in the '828 application from which the '630 patent issued, the Examiner stated that the present invention discloses:

“a silicon oxide insulating film includes halogen at a concentration of  $1 \times 10^{17}$  to  $5 \times 10^{20} \text{ cm}^{-3}$  and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less.”

U.S. Patent No. 5,313,075 (Zhang et al.)

U.S. Patent No. 5,313,075 discloses a gate insulated thin film transistor where a halogen is added to either or both of the blocking layer and a gate insulator of the transistor. More specifically, Zhang et al. discloses in Col. 9, lines 57-64 that:

“[t]herefore it is best if the added halogen element is less than 20% volume, normally 2 to 20% is good. Incidentally, when halogen gas

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was added at 1 volume % with respect to oxygen gas during the film formation, measuring by SIMS (secondary ion mass analysis), it was found that the density of halogen in the film was  $2 \times 10^{20}$  atoms/cm<sup>3</sup>."

In addition, Zhang et al. also discloses in Col. 10, lines 60-64 that:

"[u]sing SIMS analysis, the quantity of oxygen impurities in the semiconductor film formed with this method is found to be  $2 \times 10^{20}$  atoms·cm<sup>-3</sup>, the quantity of carbon was  $5 \times 10^{18}$  atoms·cm<sup>-3</sup>, and the quantity of hydrogen mixed in is less than 5%."

However, Zhang et al. clearly states in Col. 10, line 61 that the film having the measured carbon is a semiconductor film and not an insulating film.

Furthermore, Zhang et al. discloses in Col. 15, lines 55-59 that:

"[i]n the above embodiments, in order for the Na or K neutralization, the halogen gasses such as fluorine are used, however, other gasses such as phosphorus, carbon, or nitrogen with a density of  $1 \times 10^{19}$  to  $5 \times 10^{20}$  atomic % can also be used."

However, it is unclear whether the description above indicates a ratio of gasses or a concentration in a film.

Consequently, although Zhang et al. discloses a particular density range of halogen in a film, the reference fails to disclose such a film having both the halogen density and a carbon density in accordance with the subject '630 patent. Although Zhang et al. also discloses a film having a particular density of carbon, the carbon is provided in a semiconductor film and not in an insulating film as claimed in the subject '630 patent. Moreover, the reference further fails to disclose the specific ranges of halogen at a

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concentration of  $1 \times 10^{17}$  to  $5 \times 10^{20} \text{ cm}^{-3}$  and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less as claimed in the '630 patent.

U.S. Patent No. 4,772,927 (Saito et al.)

U.S. Patent No. 4,772,927 submitted herewith is noted for disclosing in Col. 3, lines 22-31 that:

“[b]esides, in the present invention, preferably at least one element among oxygen, nitrogen and carbon is contained at a low concentration in the vicinity of polycrystalline silicon-insulator film interface in which the channel of the polycrystalline-silicon MOS transistor element is formed, in order to prevent the threshold voltage from increasing, and it is contained at a higher concentration in the other regions. Also, preferably, the concentration of at least one element among oxygen, nitrogen and carbon is set within a range of  $10^{19}$ - $10^{22} \text{ atoms/cm}^3$ .”

Therefore, Saito et al. discloses carbon concentration in a polycrystalline silicon film in a range of  $10^{19}$ - $10^{22} \text{ atoms/cm}^3$  but fails to disclose such carbon concentration in an insulating film or such an insulating film with a halogen.

U.S. Patent No. 5,313,076 (Yamazaki et al.)

U.S. Patent No. 5,313,076 also submitted herewith is noted for disclosing a concentration of carbon in a silicon film measured by SIMS. (See Abstract; Col. 5, lines 27-31; Col. 7, lines 7-15, 52-68; Col. 8, lines 1-20; Col. 10, lines 48-66; Col. 11, lines 65-68; and Col. 12, lines 3-24). Although '076 patent discloses a field effect transistor with carbon detected by SIMS as described, it is not clear if the insulating film includes the impurity at the concentration as claimed in the '630 patent. Moreover, the '076 patent further fails to disclose such an insulating film having a halogen concentration.

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U.S. Patent No. 5,288,518 (Homma) and related Japan Doc. No. 04-360533

U.S. Patent No. 5,288,518 and related Japan Doc. No. 04-360533 are noted for disclosing a film which has a composition of  $\text{SiO}_{1.85}\text{F}_{0.15}$  as determined by X-ray photoelectron spectrometry. (See Col. 2, lines 61-65 of the '518 patent). However, the references do not disclose the range of halogen concentration or the provision of carbon.

U.S. Patent No. 5,821,138 (Yamazaki et al.)

U.S. Patent No. 5,821,138 is noted for disclosing a film with a halogen element having density of  $1 \times 10^{16}$  to  $1 \times 10^{18}$  and carbon at a density of  $1 \times 10^{16}$  to  $5 \times 10^{19}$  atoms  $\text{cm}^{-3}$ . (See Col. 11, lines 19-39). However, the reference discloses that the halogen element and the carbon is provided in a crystalline silicon film or monocrystal-like region and thus, fails to disclose the concentrations of halogen element and carbon in an insulating film.

U.S. Patent No. 5,837,614 (Yamazaki et al.)

U.S. Patent No. 5,837,614 is noted for disclosing an insulating film consisting essentially of silicon oxide having halogen elements in the amount of  $1 \times 10^{17}$  from  $5 \times 10^{20}$   $\text{cm}^{-3}$  as impurity elements by secondary ion mass spectrometry, while the carbon concentration is  $5 \times 10^{19}$   $\text{cm}^{-3}$  or less. (See Col. 3, lines 18-28). However, the '614 patent is not a prior art document and should not be applied against the present '630 patent for the following reasons. First, the '614 patent is related to the present '630 patent. The '614 patent is a continuation application based on U.S. Ser. No. 08/198,054 (now abandoned). However, the '054 application is also the parent of U.S. Ser. No. 08/455,574 (now abandoned) which is the parent of U.S. Ser. No. 08/734,127 (issued as U.S. Pat. No. 5,866,932) which in turn, is the parent of U.S. Ser. No. 09/190,828 that issued as the subject '630 patent. In addition, the subject matter currently claimed in the subject '630 patent was originally present in the original parent '054 application.

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Consequently, both the '614 patent and the subject '630 patent have the original application Ser. No. 08/198,054 as their parent and are thus, related to one another and have the same priority date, at least to the filing date of the original application Ser. No. 08/198,054. Moreover, the '614 patent issued on November 17, 1998 which is after the November 12, 1998 filing date of the '828 application that issued as the subject '630 patent. Thus, for the above reasons, the '614 patent should not be held to be prior art against the subject '630 patent.

Japan Doc. No. 01-238024

Japan Doc. No. 01-238024 which is a prior art reference cited in Japan Doc. No. 05-267480 discussed below, discloses an oxide film formed on a substrate by plasma CVD method using a raw material such as tetraethoxysilane and nitrogen, or a mixing as of nitrogen and other gases. (See translation Pg. 3, lines 15-18 and Pg. 4, lines 1-4). However, concentration of these elements in the oxide film is not measured and thus, the reference fails to disclose any concentration values.

Japan Doc. No. 03-036767

Japan Doc. No. 03-036767 discloses a gate insulating film formed by plasma CVD using monosilane derivative gas containing at least one element selected from chlorine and fluorine. (See translation Pg. 3, lines 15-18 and Pg. 4, lines 1-4). However, the reference fails to disclose the amount of the element in the gate insulating film.

Japan Doc. No. 03-268429

Japan Doc. No. 03-268429 is related to U.S. Patent No. 5,275,977 which was cited and already considered during the prosecution of the '630 patent. These references disclose an SiO<sub>2</sub> film formed using an organic silane gas by plasma CVD with an etching

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as containing fluorine atoms. (See translation of Abstract). The insulating film is deposited using  $\text{Si}(\text{OC}_2\text{H}_5)_4$ ,  $\text{O}_2$ , and  $\text{CF}_4$  as disclosed in the U.S. reference. However, the references fail to disclose any concentration amounts of the various elements.

Japan Doc. No. 03-289140

Japan Doc. No. 03-289140 is noted for merely disclosing the deposition of an a-Si:H film, subjecting the a-Si:H film to solid growth, and forming an oxide film at a surface of a solid growth silicon film by an oxygen plasma. (See translation of Abstract). However, the reference does not disclose the range of halogen or the range of carbon as claimed in the subject '630 patent.

Japan Doc. No. 05-267480

Japan Doc. No. 05-267480 discloses a silicon oxide film which is formed by a plasma CVD method using organic oxysilane such as TEOS as a main material. (See translation of Abstract). In addition, the reference further discloses that the concentration of carbon within the BPSG film with silane as a main raw material is about  $50 \times 10^{18}$  atoms/cc, and is approximately the same as a background value of SIMS analysis. (See translation Pg. 10, lines 18-21). However, the reference does not disclose the range of halogen or the range of carbon as claimed in the subject '630 patent.

Japan Doc. No. 06-053503

Japan Doc. No. 06-053503 is merely noted for disclosing a  $\text{SiO}_2$  film formed using  $\text{O}_2$  gas, TEOS (tetraethoxysilane) gas and  $\text{Cl}_2$  gas through the plasma CVD method. (See translation of Abstract). However, the reference does not disclose the range of halogen or the range of carbon as claimed in the subject '630 patent.

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Japan Doc. No. 06-287755

Japan Doc. No. 06-287755 is also merely noted for disclosing a SiO<sub>2</sub> film formed using gaseous raw materials such as TEOS (tetraethoxysilane) and an oxidative gas such as O<sub>2</sub> through the plasma CVD method. (See translation of Abstract). However, the reference does not disclose the range of halogen or the range of carbon as claimed in the subject '630 patent.

In view of the above identified portions of the various cited references, as well as the Notice of Allowance noted above, the Examiner may deem that one or more of the newly cited references present a substantial new question of patentability. In particular, each of the independent claims of the '630 patent recite a film comprising silicon oxide and including halogen at a concentration of  $1 \times 10^{17}$  to  $5 \times 10^{20}$  cm<sup>-3</sup> and carbon at a concentration of  $5 \times 10^{19}$  cm<sup>-3</sup> or less. As identified in the quoted portions above, Zhang et al. discloses a silicon oxide film with density of halogen of  $2 \times 10^{20}$  atoms/cm<sup>3</sup> but does not appear to disclose carbon concentration in the insulating film. In addition, Saito et al. discloses a carbon concentration range of  $10^{19}$ - $10^{22}$  atoms/cm<sup>3</sup> but this carbon concentration is provided in the polycrystalline silicon film and not in an insulating film. Furthermore, as described above, whereas many references disclose carbon or halogen element in a silicon oxide film, none of these references (with the exception of U.S. Patent No. 5,837,614 which is related to the subject '630 patent as described) teach the claimed concentrations of these elements in the insulating silicon oxide film. Moreover, whereas U.S. Patent No. 5,837,614 does disclose the presently claimed invention in the subject '630 patent, the '614 patent is related to the subject '630 patent in that the '614 patent issued from the same parent application as the '630 patent. In this regard, both the '614 patent and the subject '630 patent have the same priority dates.

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Docket No. 740756-2265  
Patent No. 6,025,630

Lastly, it is noted that some of the claims of the subject '630 patent may not be wholly supported by the Japanese specification of the priority document Japanese Application Serial No. 5-55236 that was filed on February 19, 1993. Consequently, the claims of the subject '630 patent should be examined according to the effective filing date of February 18, 1994 based on the priority document U.S. Application Serial No. 08/198,054 ('054 application), a verified English translation of the Japanese Application Serial No. 5-55236 having been submitted during the prosecution of the U.S. '054 application.

The Commissioner is hereby authorized to charge fees under 37 C.F.R. § 1.16 and 1.17 (except the Issue Fee) which may be required now or hereafter, or credit any overpayment, to Deposit Account No. 19-2380.

Respectfully submitted,



Eric J. Robinson  
Registration No. 38,285

NIXON PEABODY LLP  
8180 Greensboro Drive, Suite 800  
McLean, Virginia 22102  
(703) 790-9110  
(703) 883-0370 (Fax)

Date: 7-10-91

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740756-2265  
UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
90/006,057	07/10/01	6025830	

022204  
NIXON PEABODY, LLP  
8180 GREENSBORO DRIVE  
SUITE 800  
MCLEAN VA 22102

MM21/1004

MINTELLA EXAMINER

ART UNIT

PAPER NUMBER

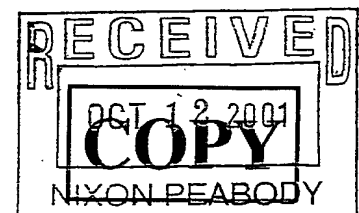
10/04/01

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DOCKETED  
10-12-01 By PAX  
Nixon Peabody, LLP





UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
90/006,057	07/10/01	0025005	

622204  
NIXON PEABODY, LLP  
8180 GREENSBORO DRIVE  
SUITE 800  
MCLEAN VA 22102

MM21/1004

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
90/006,057	07/10/01	5025630	740756-1255

022284  
NIXON PEARBODY, LLP  
8180 GREENSBORO DRIVE  
SUITE 501  
MOLENAAR, VA 22102

MM21/1004

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CONTROL NUMBER	FILING DATE	PATENT UNDER REEXAMINATION	ATTORNEY DOCKET NO.
90/006,057	7/10/01		

EXAMINER
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ART UNIT	PAPER NUMBER
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DATE MAILED:

## ORDER GRANTING/DENYING REQUEST FOR REEXAMINATION

The request for reexamination has been considered. Identification of the claims, the references relied on, and the rationale supporting the determination are attached.

Attachment(s): ☐ PTO-892, ☐ PTO-1449, ☐ Other: \_\_\_\_\_

1. ☒ The request for reexamination is GRANTED.

RESPONSE TIMES ARE SET TO EXPIRE AS FOLLOWS:

For Patent Owner's Statement (optional): TWO MONTHS from the mailing date hereof. 37 CFR 1.530(b)  
EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).

For Requester's reply (optional): TWO MONTHS from the date of service of any patent owner's statement 37 CFR 1.535. NO EXTENSION OF TIME IS PERMITTED. If patent owner does not file a timely statement under 37 C.F.R. 1.530(b), no reply by requester is permitted.

2. ☐ The request for reexamination is DENIED.

This decision is not appealable. 35 U.S.C. 303(c). Requester may seek review by petition to the Commissioner within ONE MONTH from the mailing date hereof. 37 CFR 1.515(c). EXTENSIONS OF TIME ONLY UNDER 37 CFR 1.183.

In due course, a refund under 37 CFR 1.26(c) will be made to requester (listed below if not patent owner)  
☐ by Treasury check, ☐ by credit to Deposit Account No. \_\_\_\_\_  
unless notified otherwise. 35 U.S.C. 303(c).

(Third party requester's correspondence address)

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90/006,057

1. A substantial new question of patentability affecting claims 1-16 of United States Patent Number 6,025,630 is raised by the request for reexamination.

Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extension of time in reexamination proceedings are provided for in 37 CFR 1.550(c).

2. The request indicates that Requester considers that a substantial new question of patentability may exist as to claims 1-16 in light of the fourteen new references submitted by the Requester.

3. It is agreed that the consideration of U.S. Patent No. 5,313,075 to Zhang et al. raises a substantial new question of patentability as to claims 1-16. There is a substantial likelihood that a reasonable Examiner would consider this disclosure important in deciding whether or not the claimed insulator is patentable because Zhang '075 in column 15, lines 55-59, suggests that the claimed amounts of halogen and carbon may be used in an insulator. Accordingly, this paragraph of Zhang '075, in particular, raises a substantial new question of patentability.

4. It is agreed, as noted by the Requester at page 6, that U.S. Patent No. 4,772,927 to Saito et al. discloses carbon in polycrystalline silicon, not in the claimed insulator. Moreover, Saito does not disclose the claimed halogen. Therefore, Saito does not raise a new question as to patentability.

5. It is agreed, as noted by the Requester at page 6, that U.S. Patent No. 5,313,076 to Yamazaki et al. discloses carbon in amorphous silicon, not in an insulator. Additionally, Yamazaki does not disclose halogen. Accordingly, Yamazaki does not raise a new question as to

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patentability.

6. It is agreed, as noted by the Requester at page 7, that U.S. Patent No. 5,288,518 to Homma and related Japan Doc. No. 04-360533 do not disclose the claimed halogen or carbon. Accordingly, no new question as to patentability is raised.

7. It is agreed, as noted by the Requester at pages 7-8, that U.S. Patent No. 5,837,614 to Yamazaki et al. does disclose the claimed halogen and carbon in an insulator. However, this reference is not prior art for formal reasons as explained at pages 7-8. Therefore, no new question as to patentability is raised.

8. It is agreed, as noted by the Requester at page 8, that Japan Doc. No. 01-238024 does not disclose concentration amounts. Moreover, this reference does not disclose halogen or carbon in an insulator. Therefore, no new question as to patentability is raised.

9. It is agreed, as noted by the Requester at page 8, that Japan Doc. No. 03-036767 does not disclose the amount of halogen. Moreover, this reference does not disclose the claimed carbon. Accordingly, no new question of patentability is raised.

10. It is agreed, as noted by the Requester at pages 8-9, that Japan Doc. No. 03-268429 fails to disclose the amount of fluorine in an insulator. Moreover, this document does not disclose carbon. Accordingly, no new question of patentability is raised.

11. It is agreed, as noted by the Requester at page 9, that Japan Doc. No. 03-289140 omits disclosure of the claimed halogen or carbon. Therefore, no new question of patentability is raised.

12. It is agreed, as noted by the Requester at page 9, that Japan Doc. No. 05-267430 does not disclose the claimed halogen. However, column 10, lines 18-21 of the translation disclose

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about  $50 \times 10^{18}$  atoms/cc of carbon in a silicon dioxide film. Therefore, this reference raises a new question of patentability.

13. It is agreed, as noted by the Requester at page 9, that Japan Doc. No. 06-053503 lacks the claimed halogen and carbon. Accordingly, no new question of patentability is raised.

14. Similarly, it is agreed, as noted by the Requester at page 10, that Japan Doc. No. 06-287755 lacks the claimed halogen and carbon. Accordingly, no new question of patentability is raised.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. Mintel whose telephone number is (703) 308-4916.

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W.M.

October 4, 2001

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W.M.

October 3, 2001

*William Mintel*

**William Mintel**  
**Primary Examiner**  
**Art Unit 2811**

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